

CLAIMS

1. A method of fracturing a subterranean formation comprising injecting a fracturing fluid, into a hydraulic fracture created into a subterranean formation, wherein at least a portion of the fracturing fluid comprises at least one device actively transmitting data that provide information on the device position, and further comprising the step of assessing the fracture geometry based on the positions of said at least one device.
 2. The method of claim 1, wherein said device is an electronic device.
 3. The method of claim 2, wherein said device is a radio frequency transmitter.
 4. The method of claim 1, wherein said device is an acoustic device.
 5. The method of claim 4, wherein said device is an ultrasonic transceiver.
 6. The method of claim 1, wherein at least one device is pumped during the pad stage and at least one device is pumped during the tail portion.
 7. The method of claim 1, wherein said device also transmits information as to the temperature of the surrounding formation.
 8. The method of claim 1, wherein said device also transmits information as to the pressure.
 9. A method of fracturing a subterranean formation comprising injecting a fracturing fluid, into a hydraulic fracture created into a subterranean formation, wherein at least a portion of the fracturing fluid comprises metallic elements and further comprising the step of locating the position of said metallic elements with a tool selected from the group consisting of magnetometers, resistivity tools, electromagnetic devices and ultra-long arrays of electrodes.
 10. The method of claim 9, wherein said metallic material comprises elongated particles having a length to equivalent diameter greater than 5
 11. The method of claim 10, wherein said particles have a shape with a length-basis aspect ration greater than 10.

12. The method of claim 10, wherein said elongated particles have a wire-segment shape.
13. The method of claim 10, wherein said elongated particles are in a material selected from the group consisting of iron, ferrite, low carbon steel, stainless steel and iron- alloys.
5
14. The method of claim 10, where said elongated particles consists of metallic wires having a hardness of between 45 and 55 Rockwell.
15. The method of claim 10, wherein said elongated particles are resin-coated.
16. The method of claim 10, wherein said elongated particles have a length of
10 between 1 and 25mm.
17. The method of claim 17, wherein said elongated particles have a length of between about 2 and about 15mm.
18. The method of claim 10, wherein said elongated particles have a diameter of between about 0.1mm and about1mm.
- 15 19. The method of claim 10, wherein said individual particles of said elongated particulate material have a diameter of between about 0.2mm and about 0.5mm
20. The method of claim 1, wherein the geometry of the fracture is monitored in real-time during the hydraulic fracturing treatment.
21. The method of claim 9, wherein the geometry of the fracture is monitored in real-time during the hydraulic fracturing treatment.
20

2025 RELEASE UNDER E.O. 14176